

### Background Research

Bp uses hair mats in the ocean to catch oil. These hair mats were made out of human hair that they received through donations. The hair was taken and compacted into a material similar to panty hose making it very dense. Coffee filters catch most particles, even really small ones. Skimming is a popular way to separate oil and water because it catches the oil and takes it away from the water.

### Description of prototype structure and function

Our prototype will contain two water bottles, two coffee filters and some human hair. There is a myth that hair “absorbs” oil and we are wanting to test this theory. We will cut the bottom off the water bottles off and place turn them upside down. We will then place one of the coffee filters in the bottom water bottle in the top (which is now the bottom). Our second coffee filter will be wrapped around the outside of the top water bottle and secured with a rubber band. Once the coffee filters are in place we will place a thin of layer of human hair to help with absorption. The hair will go inside the water bottles on the smaller end. The bottles will stack together so the oil will go through the filtering cycle twice.



Our goal for function is the cracks in the hair will catch some of the oil and the remaining will stick to the coffee filter. As the oil is sticking to the coffee filter the water will go through separating the two substances.

### Testing the Prototype



**Analysis of results**

For the most part our prototype was effective. The hair and coffee filters caught oil. We had a few outlying factors such as the coffee filter collapsing on the side and releasing a large amount of oil into our filtered water. Before our coffee filter collapsed we had roughly 100 mL of filtered water with only a very small amount of oil in it.

A few things we would change with this experiment is double up on our coffee filters so they would be stronger. We would also seal up the holes where we were holding up the second bottle so the water/oil mixture wouldn't be able to get through.

